

## Indian Pteridophytes Used in Folk Remedies

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The medicinal qualities of ferns, real or imaginary, are mentioned as early as 300 B.C. by the Greek philosopher Theophrastus (Corne, 1924a) and by his Indian contemporaries Sushrut and Charak. Dioscorides also speaks of brake fern, male fern, and others. Among the medicinal plants mentioned in old Indian texts, two are definitely ferns. One of these, called "Myurshikha" or "Myurpankha," meaning peacock's feather, has been identified as *Adiantum caudatum* L. by some persons; others consider it to be *Actiniopteris radiata* (Swartz) Link. The other drug called "Hanspad" or "Hansraj," meaning swan's foot, appears to be some species of *Adiantum*, most probably *A. capillus-veneris* L., *A. lunulatum* Burm. f. or *A. venustum* D. Don. In addition to these plants there are about 40 species of pteridophytes used as drugs. Of these *Dryopteris filix-mas* (L.) Schott is included in the pharmacopoeias of many countries. In the 1955 Pharmacopoeia of India this plant is replaced by the allied species, *D. odontoloma* (Moore) C. Chr., *D. marginata* (Wall.) Christ, and *D. schimperiana* (Hochst.) C. Chr., and in the 1966 Pharmacopoeia of India by *D. odontoloma*, *D. marginata*, *D. chrysocoma* (Christ) C. Chr., *D. ramosa* (Hope) C. Chr., and *D. barbigera* (Hook.) Kuntze. *Lycopodium clavatum* is included in the Indian Pharmaceutical Codex (Mukerji, 1953) and in the proposed Indian Homeopathic Pharmacopoeia. *Equisetum arvense* L. is included in the U.S.S.R. Pharmacopoeia (1961) and in the German Pharmacopoeia (Wealth of India), and Puri (1969) has recommended its inclusion in the Indian Pharmacopoeia. The species of *Adiantum* mentioned above are used unofficially in some of the patented cough preparations marketed in India. The rest of the plants mentioned below are used in domestic and rural medicines.

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*Actiniopteris radiata* (Swartz) Link.—Used as an anthelmintic (Watt, 1889; Kirtikar & Basu, 1935; Chopra et al, 1958; Chuneekar & Pandey, 1969), as an alterative in prolonged malarial fevers (Nadkarni, 1954; Chopra et al.), and as an astringent to arrest hemorrhages (Chuneekar & Pandey).

*Adiantum aethiopicum* L.—Infusion of leaves used as an emollient in coughs and diseases of the chest (Caius, 1935).

*Adiantum capillus-veneris* L.—According to Watt, the bulk of *Adiantum* sold medicinally in India is this species. A decoction of the fronds of this plant is considered quite effective in all types of bronchial troubles (Watt; Nadkarni; Steinmetz, 1954; Wren, 1956; Uphof, 1959). An infusion of the herb serves as a shampoo against dandruff and also promotes hair growth (Watt; Steinmetz; Wren). The plant is considered as an emmenagogue (Nadkarni; Uphof). The juice of the plant with pepper is recommended for all types of fevers (Nadkarni; Biswas, 1955). It is used for hydrophobia by the physicians of the Persian system of medicine (Watt).

*Adiantum caudatum* L.—Fronds used for diabetes, coughs (Kirtikar & Basu; Chopra et al), and for migraine (Stewart, 1869). Also used externally for skin diseases (Chopra et al).

*Adiantum lunulatum* Burm. f.—One of the constituents of Hansraj, the drug esteemed in India for coughs. It is considered a bronchio-dilator, diuretic (Chopra et al) and pectoral (Caius). In western India used extensively in the treatment of fevers of children; the rootstock is considered good for fever and elephantiasis (Kirtikar & Basu).

*Adiantum venustum* D. Don—According to Kirtikar and Basu the fronds of this plant are the source of the Indian drug Hansraj. Because of the black color of the stalks of the fronds, it is sometimes known by the name of black Hansraj. The plant is administered as an anodyne in bronchitis and is considered a diuretic and emmenagogue (Stewart, Kirtikar & Basu; Chopra et al). It is a tonic, febrifuge, and expectorant, and is particularly useful as a tonic during convalescence from fevers (Caius).

*Asplenium adiantum-nigrum* L.—A decoction or syrup of the fronds is used as an emmenagogue (Kirtikar & Basu). It is bitter,

diuretic, and laxative, and is considered useful in ophthalmia and diseases of the spleen and jaundice. It is believed to cause sterility in women (Chopra et al.).

*Asplenium falcatum* Lam.—Used in enlargement of the spleen, incontinence of urine, calculus, jaundice, and malaria (Kirtikar & Basu).

*Asplenium ruta-muraria* L.—It is used for rickets (Chopra et al), and as an expectorant (Nadkarni) and deobstruent (Kirtikar & Basu). According to Steinmetz, "Herba Rutae Murariae" is an expectorant and cures diseases of the spleen. It prevents hair from falling and makes it grow (Ferne, 1914; Steinmetz).

*Asplenium trichomanes* L.—Considered a laxative (Ferne; Chopra et al) and anthelmintic (Nadkarni). The leaves are sweet, mucilaginous, and are an expectorant highly useful in pulmonary disorders (Caius).

*Athyrium filix-femina* (L.) Roth.—Used as a substitute for the Male Fern, but has been found quite ineffective (Chopra et al).

*Botrychium* spp.—Various species of this genus, such as *B. lunaria* (L.) Swartz, *B. ternatum* (Thunb.) Swartz (Chopra et al), and *B. virginianum* (L.) Swartz (Kirtikar & Basu), are used in dysentery, ruptures, and for healing wounds (Wealth of India).

*Cibotium barometz* (L.) J. Smith—The rhizome is used as a vermifuge and the root as a tonic. The long, silky, yellowish hairs at the base of the fronds cause rapid coagulation of the blood and when properly used are useful for arresting hemorrhages from capillaries (Wealth of India). The root is employed as a tonic in China, where it is said to exercise a special action on the genito-urinary organs (Kirtikar & Basu). Used in typhoid and in the treatment of dyspepsia and coughs (Chopra et al).

*Drynaria quercifolia* (L.) J. Smith.—The rhizome is bitter, tonic, and astringent to the bowels. It is also used in typhoid and in the treatment of dyspepsia and coughs (Chopra et al). A decoction of the rhizome is used as an astringent (Uphof).

*Dryopteris filix-mas* (L.) Schott.—One of the oldest anthelmintic drugs, commonly known as Male Fern, and used since ancient

times for expelling tape-worms from the intestines. This fern does not grow naturally in India, but various allied species which are up to British Pharmacopoeial and United States Pharmacopoeial standards are used (Indian Pharmacopoeia, 1955, 1966). The use of *D. filix-mas* does not appear to be harmless. According to Steinmetz, its application may cause paralysis of the muscles and nerves, and even blindness. This may be due to the presence of the enzyme thiaminase, which destroys thiamin (Pohl, 1955).

*Equisetum arvense* L.—“Herba Equisiti Arvensis” has diuretic and astringent qualities (Steinmetz; Wren) and is quite useful for urinary and bladder diseases (Uphof), and for stopping the flow of blood in urine (Steinmetz). An oral administration produces a decided increase in blood corpuscles. The plant is used for acidity of the stomach and dyspepsia. (Wealth of India).

*Equisetum debile* Roxb.—Diuretic and astringent (Biswas), and given for gonorrhoea (Stewart).

*Helminthostachys zeylanica* (L.) Hook.—The plant has intoxicating and anodyne properties and is used in sciatica (Chopra et al; Wealth of India). Rhizome used for malaria (Uphof). The Malays regard the rhizome as a tonic, and eat it with betel for whooping cough. In Java used for dysentery, catarrh, and the early stages of phthisis (Wealth of India).

*Lycopodium cernuum* L.—In Malaya a decoction of the plant used as a lotion in beri-beri and also for coughs and uneasiness in the chest. An embrocation of the ashes in vinegar is recommended for skin eruptions (Wealth of India).

*Lycopodium clavatum* L.—Mainly the spores of this plant are used in medicine. English druggists included this powder in their list of drugs before 1692. It was introduced in the U.S. Pharmacopoeia of 1860 (Whitebread, 1941). This drug has been used internally with good results in urinary disorders, such as the spasmodic retention of urine, catarrhal cystitis, and chronic kidney diseases causing pain in the kidney, ureter, and bladder (Wren; Nadkarni; Biswas). Also used in dyspepsia, catarrhal gastritis, and as a general and gastric sedative (Wren). The plant is also given to stop hemorrhages after childbirth (Biswas). In the form

of a tincture it is given for rheumatism, epilepsy, and pulmonary disorders (Nadkarni). An aqueous extract of it has been employed in various countries as an antipyretic (Wealth of India, 1962).

Sometimes the spores of *L. annotinum* L., *L. complanatum* L. and *L. selago* L. are also used for the above purposes (Wealth of India). Frequently *Lycopodium* spores are adulterated with such substances as slightly roasted and colored starch, dextrin, and various pollens (Whitebread).

The *Lycopodium* powder has side effects. Whitebread has quoted instances where it has acted as foreign body and has given rise to an indolent chronic post-operative inflammatory reaction. The alkaloids of this drug have also been found harmful to warm-blooded animals. A variety of reactions, such as pressor effects, stimulation and contraction of the uterus, and paralysis are attributed to these alkaloids (Wealth of India).

*Lygodium circinnatum* (Burm. f.) Swartz—The spikes of this plant are reported to be used in Indonesia as an external application for wounds (Wealth of India).

*Lygodium flexuosum* (L.) Swartz—Used as an expectorant. Fresh rootstocks are applied externally for rheumatism, sprains, scabies, eczema, and cut wounds, and are reported to be particularly useful for carbuncles (Caius).

*Lygodium japonicum* (Thunb.) Swartz—Used as an expectorant. In China a decoction of the vegetative parts and spores is used as a diuretic (Wealth of India).

*Lygodium microphyllum* (Cav.) R. Brown—A decoction of leaves given for dysentery. Leaves are also applied as poultices for skin diseases and swellings (Kirtikar & Basu).

*Marsilea quadrifolia* L.—This is probably the plant used in ancient India under the name of "Sparka" for leprosy and skin diseases, fever, and for poisoning of blood (Chunekar & Pandey).

*Ophioglossum vulgatum* L.—The leaves boiled in oil or fat are considered a remedy for wounds. This preparation cools inflammation (Ferne; Chopra et al).

*Osmunda regalis* L.—Considered a tonic and styptic, and used against rickets (Chopra et al). The middle part of the plant boiled

in liquid is considered good for wounded persons. The rootstock, stamped in water or gin until the liquor becomes a stiff mucilage, has been used to cure back pains (Ferne).

*Polypodium vulgare* L.—An infusion of “Herba Polypodii” is a mild laxative and expectorant. An aqueous extract of “Rhizoma Polypodii” is recommended in the obstruction of viscera, liver and gland diseases, and coughs and chills (Steinmetz). In northern India this or a related species is used as an alterative (Stewart).

*Polystichum squarrosus* (D. Don) Fée—The rhizome of this plant is sold in the Indian market under the name “Nirbissi,” and the drug is used as an antidote to poisons; it is a possible substitute for the male fern (Mittal, 1953).

*Pteridium aquilinum* (L.) Kuhn.—The rhizome is astringent and is useful for diarrhea and inflammation of the gastric and mucous membranes. Boiled in oil or hog’s fat, the rhizome is made into an ointment for wounds. A decoction of the rhizome and fronds has been given in chronic disorders arising from obstruction of the viscera and spleen (Wealth of India). It is also used instead of hops (Corne, 1924b).

*Pteris ensiformis* Burm. f.—The juice of the young plant is stated to possess astringent properties; a decoction of fresh fronds is given in dysentery. The juice of the rhizome is applied in the glandular swelling of the neck (Wealth of India).

*Pteris multifida* Poir. (*P. serrulata* L. f.)—In China a tincture or decoction of rhizome is given in dysentery. Also said to be a good vermifuge. The toasted fronds and rhizome are made into a paste with sesame oil and applied to the skin afflictions of infants (Wealth of India).

*Selaginella* spp.—Apparently dry plants of some species appear to become fresh and green again when put into water. Because of this, physicians of the Indian system of medicine use it as a rejuvenator for the human body. It is also given in mental diseases, rickets, blood vomiting, and spermatorrhoea (Chunekar & Pandey).

*Tectaria polymorpha* (Wall.) Copel.—Used as an anthelmintic (Kirtikar & Basu).

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